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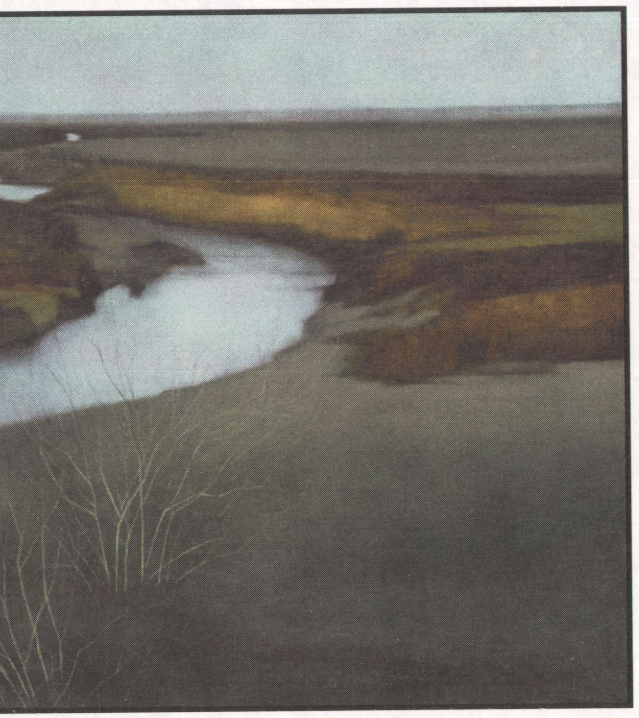

y, 1996: Connie Borup, Oil on canvas.

FRIENDS of Great Salt Lake

P.O. Box 2655, Salt Lake City, Utah 84110-2655
mail@fogsl.org
801-583-5593

Volume 10 Number 2
Winter 2004

Tree Stories, 2000: Connie Borup, Oil on canvas.

The mission of FRIENDS of Great Salt Lake is to preserve and protect the Great Salt Lake ecosystem and to increase public awareness and appreciation of the lake through education, research, and advocacy.

President's Message

Think Comprehensively, Act Accordingly

"Consider that we are only the very latest people to live near the Lake over more than ten millennia, and that most who inhabited these shores during all that time drew material and spiritual nourishment without changing her at all. That thought ought to humble us. Perhaps we owe something to all those men and women who preceded us in this place. We could gain much by allowing ourselves to become again, if only in some small degree, a people of the Lake."

-Dean May in Images of The Great Salt Lake, 1996 (Centennial)

Farmington Bay by Connie Borup

I want to begin by thanking all of you for your participation in the recent public commenting process on the Natural Resource Damage (NRD) Settlement Proposal between the State of Utah, Kennecott Utah Copper and the Jordan Valley Water Conservancy District.

Your passion and clarity about your concerns for the Great Salt Lake Ecosystem and the health and welfare of all of us who live within its watershed was uplifting. Making new friends and learning a great deal about my neighborhood around Great Salt Lake helped strengthen my commitment to work even harder toward what's best for our quality of life and for the long term quality of life of the Lake.

You did a tremendous job of staying on message about specific problems we have with this proposal. One of the most obvious problems being the glaring lack of baseline data on selenium and sulfates in our rivers, wetlands, and Great Salt Lake. If decisions are made without the benefit of rock solid science to determine key contaminant thresholds in the system, they are in danger of being arbitrary and capricious. The lack of scientific integrity of those decisions undermines any assurances we are given about cleaning up one source of contamination without creating another.

The Trustee of the NRD Settlement Proposal is Dr. Dianne Nielson. She is also, of course, Executive Director of the Department of Environmental Quality. In both roles she has a responsibility to act in the interest of the Public Trust Doctrine on behalf of and in protection of its natural resources. Every day requests for permits abound: solid and hazardous waste, air quality, water quality, and permits to fill wetlands, just to name a few. The situation becomes even more challenging when decisions about key lake resources such as wildlife management, mineral extraction, and water resources are also being made by seven different agencies within the Department of Natural Resources.

The Importance of You

The strength of FRIENDS comes from its members. All of you, with y Lake awareness, help provide this organization with the momentum We all know about the tremendous challenges and opportunities fo and opportunities, FRIENDS' board of directors works hard to identif our critical activities:

- The Legacy highway campaign
- Commenting on the Great Salt Lake Comprehensive Ma
- Educating the public at large about the importance of ou
- Participating in public hearings and on committees that

But without the support and participation of the membership, the w field trips, and volunteering are all ways that you can help build pu Through these means, you also become more knowledgeable abou relationship to it.

One of the goals that the board continues to identify at its annual develop a robust and active membership ? We need to develop a c Great Salt Lake.

So, we're asking you, our members, to keep active through participa Check your mailing label for your membership renewal due date. Re If you have questions about your membership, please call Lynn at 80

And do what you can to help recruit new members to strengthen and preservation. Pass on your newsletter to a friend or neighbor and how we are working for Great Salt Lake.

Big Thanks!

PS. Does this sound like your mother?

Thank You to Our New and Renewed M

Renewed Members

Mary Bateman
Alan Chatterton
JackComeford
Owen Kent Covey
Joan Degiorgio
Chris Dewey
Tami Fraser
Mary Gracia
John Groves
Elree Harris
David Harris
David and Lisa Hinds
Connie Holbrook
Robin Hooton
Mark Kaschmitter
Linda Katelaar
Eric McCulley
Albert Ogden
Fred and Linda Oswald
Mr. and Mrs. Tom D. Pr
Randy Speers
Marsha Swartsfager
Edith Trimmer
Alysia Watanabe
Elaine York

New Members

Stephen Bloch
Bryan Brown

Special Thanks To Our Supporters

General Fund
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Tami Fraser
Mary Gracia
Kenneth Sassen
Marsha Swartzfager
The Boulay Family
Dr. Louis Borgenicht
Ed and Marelynn Zipser

Lakeside Learning Field Trips
Steve Bloch
Marit Glenne
Patrick and Roberta Kelly
Tom and Jo Pratt

Project SLICE
Randy Speers
Walbridge Fund
Janice Bittain
David Cleveland
Rick Ford
Sarah George
Lillian and Keith Hayes
Dave and Rebecca Livermore
Wayne Martinson
David Quinney

Doyle W. Stephens Scholarship
Genevieve Atwood
Judy Gunderson
William Heeschen
Karl Kappe
John Milliken

WE want to thank **btreemedia.com, Tooele Transcript Bulletin, Xmission.com** and all who have donated to the **Transit First/Legacy Highway Lawsuit Campaign.**

SUBMITTING MATERIAL FOR PUBLICATION

Mail or Deliver to: 1117 E. 600 S. Salt Lake City, UT 84102,
E-mail to: ldefreitas@earthlink.net. Please call 801-583-5593 to confirm receipt of e-mail or with any questions, suggestions, comments, or ideas.

Deadlines: Sept. 16 (Fall), Dec. 16 (Winter), Mar. 16 (Spring), and June 16 (Summer).

The growth projections anticipated for Utah guarantee that demands in the watershed and on the Great Salt Lake system will only increase. Unless we are deliberate in our effort to move away from a piecemeal management style and toward the adoption of a holistic watershed approach, the future does not look promising,

FRIENDS has always advocated a watershed approach for Great Salt Lake preservation and protection. Remember that we discussed this at our 2000 Great Salt Lake Issues Forum when we brought in stakeholders from around the country to showcase their watershed models. Perhaps, now is the time to begin talking more seriously about a comprehensive watershed management plan for the Great Salt Lake Ecosystem.

A first step would be to commission a comprehensive and independent study of the Lake's entire system so at the very least, we would have the benefit of reliable science to work with. That would be coupled with a comprehensive monitoring program to establish those very critical baselines.

And again, thanks to all of you, the Division of Water Quality has begun to collect grab samples in the wetlands and around the Lake to help all of us understand what levels of selenium currently exists in the wetlands.

And yes, we also need to have a serious conversation about water quality standards for Great Salt Lake. Currently, as stated in the Utah Department of Natural Resources' Management Plan for the Great Salt Lake (under the authority of the Division of Forestry, Fire and State Lands), "The general policy is that, to the extent feasible, no pollutants (discharges) should be delivered to the Lake in amounts that result in concentrations greater than those already present in the Lake." Without knowing what concentrations already exist, what basis is there for allowing more contaminants to be discharged into the Lake? In other words, how do we do "no net gain" without knowing what the "net" is already?

The intense interest that has been generated over the NRD Settlement Proposal could be the very springboard to move Great Salt Lake's stewards (that means all of us) forward into a more responsible and progressive role in making decisions about its future.

And as we work with the Lake in mind, we will be consciously acknowledging Great Salt Lake as a mirror of where we live and how we live.

In saline,

Lynn de Freitas

What You Can Do

Read more about comprehensive watershed thinking by going to our website:

www.fogsl.org

Click on Research/Selected Research Materials

Vol. 1999 Number 1

Utah Law Review

Toward Comprehensive Watershed-Based Restoration and Protection for Great Salt Lake

by Robert W. Adler

Friends Organizational Statement

The mission of FRIENDS of Great Salt is to preserve and protect the Great Salt Lake Ecosystem and to increase public awareness and appreciation of the lake through education, research, and advocacy.

FRIENDS has a very active Board of Directors and an Advisory Board consisting of professionals in the scientific, political, literary, education, and broadcast communities. Founded in 1994, we have organized and sponsored an array of programs, activities and materials in pursuit of our mission.

Since 1996, we have sponsored a biennial Great Salt Lake Issues Forum that provides a gathering for policy makers, researchers, planners, industry reps and citizens who are involved in and concerned about the Great Salt Lake.

The goal of each Forum is to encourage constructive dialogue about the future of the lake's ecosystem and its resources, and to illuminate the complexities involved in research, management and planning for the lake.

In 1997, we hired Bruce Thompson as our education director and initiated a major regional education project designed to enhance both the knowledge about and care for the future of Great Salt Lake. Bruce wrote and produced a live-narrative slideshow program "The Lake Affect: Living Together Along the Shores of Something Great." Over 11,000 people in the 5 counties surrounding Great Salt Lake have seen the program.

We are presently working on video & DVD versions of The Lake Affect. With this and the Project SLICE, a Great Salt Lake curriculum correlated to the fourth grade science core curriculum, we hope to achieve a positive, long-lasting impact on the future of Great Salt Lake and those who dwell upon its shores.

In 2003, we awarded our first Doyle W. Stephens research scholarship. Until his death in May 2000, Stephens served as a research hydrologist for the U.S. Geological Survey. He is particularly remembered for his work toward increasing public awareness of the Great Salt Lake Ecosystem.

FRIENDS was awarded the Conservation Achievement Award by the Utah Chapter of the Wildlife Society in 1998.

Winter 2004 Calendar of Events

Check the local papers and www.fogsl.org for announcements of speakers and topics at our General Programs, or call our hot-line at 801-583-5593, and press 1 for monthly activities.

NOTE: General Programs are held at the Sugarhouse Garden Center, located in the northeast corner of Sugarhouse Park, 2100 South 1650 East in Salt Lake City.

On the Cover

***Tree Stories*, 2000: Connie Borup, Oil on canvas.**

I have always been fascinated by the Great Salt Lake! As a child growing up in Kaysville, I remember the view to the West with the horizontal strip of the lake separating the earth from the sky. Then when I became a landscape painter I found myself drawn to painting compositions with this same flat horizon line. The lake has offered me views that speak of the stark, sublime aspects of nature that are so important to me. I respond to bare trees as they establish their natural grid-work against water and sky. The Great Salt Lake and all of its aspects are an important part of my artistic psyche and I am very happy to participate in this publication where people share my concern and admiration for this body of water.

For more info about Connie Borup's work, contact The Phillips Gallery, Salt Lake City, 801-364-8284

Great Salt Lake Field S

GSL Field Seminar Trip to the West Desert Pumps, B

A Great Salt Lake field seminar was planned in early November as a follow up to a presentation on the West Desert Pumping Project (WDPP) by Mike Talbot, project engineer for Division of Water Resources.

Between 1963 and 1987, Great Salt Lake rose nearly 20' from its record low level of 4191' asl (above sea level) to its modern day high of 4211.85'. The last 12 feet of rise occurred between the fall of 1982 and June 1987. Construction on the pumping facility began on July 7, 1986 and it was fully operational by June 3, 1987. The construction cost of the WDPP was $62 million.

At 4211.85' Great Salt lake contained over 30 million acre feet of water and covered almost 2,400 square miles. The goal of the WDPP was to increase the natural evaporation of the lake by pumping its water into the west desert to expand its surface. The concentrated briny leftovers would then be directed back into the Great Salt Lake in order to recover the salts and minerals.

The pumping station consists of three, 16 cylinder engines, each weighing 162,800 pounds. Each 3500 hp engine is capable of pumping 1000 cubic feet per second. Because of their enormous size, the pumps were placed in position and the facility was built around them. A total of three canals were built; one canal channeled the flood-waters from the lake to the pumping station, a second canal connects the pumping station to the west desert, and a third canal carried the concentrated brine back to the lake. The floodwaters pumped into the west desert reached a maximum depth of 18 inches and covered 500 acres.

Two years after it began, the WDPP ceased pumping on June 30, 1989. During its one year of operation, WDPP lowered the lake by 14.5". Over 50,000 acres of shoreline were expo approxim

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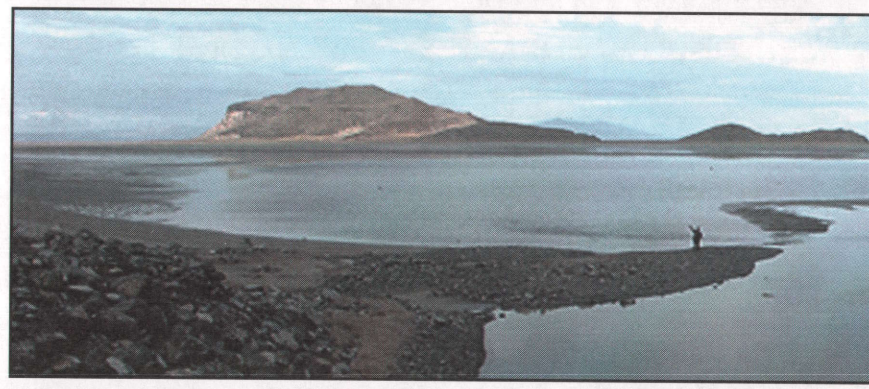

photo by Dayle Record

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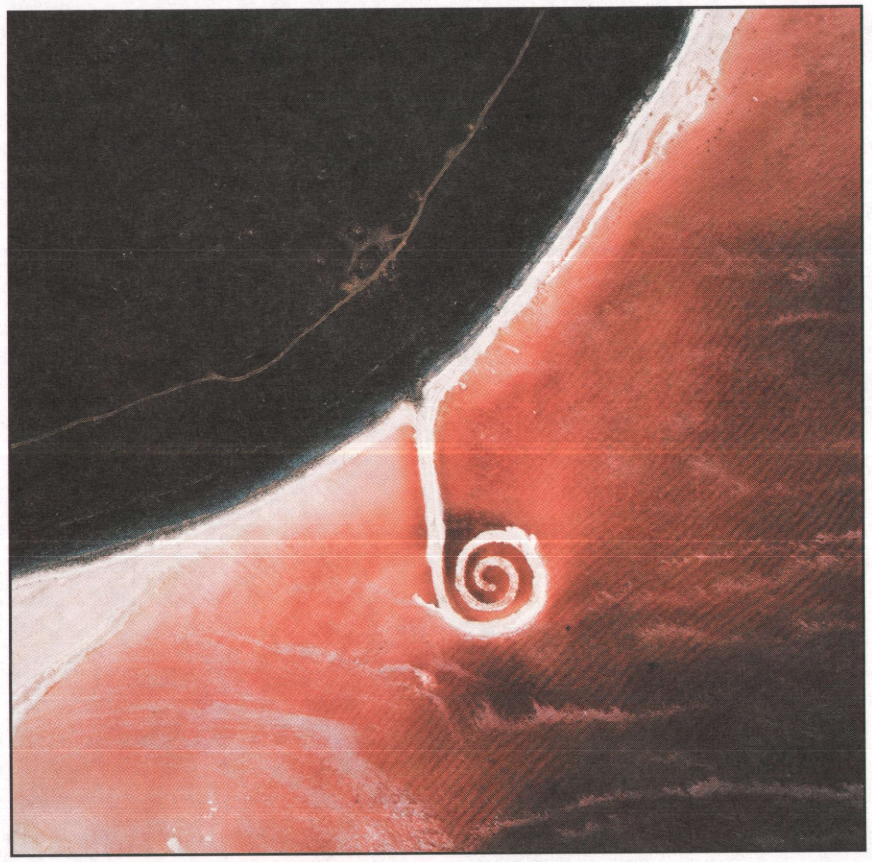
photo courtesy of FoGSL

e Shrimp by John P. George

2004 GREAT SALT LAKE ISSUES FORUM

Expressions of Great Salt Lake: The Art and Science of Our Inland Sea



Terminal Mirage #251- 4: David Maisel, © 2003

April 23-24, at the Main Salt Lake Public Library

"For well over one hundred years, visual artists have turned toward Great Salt Lake and have found in its silent geography the shapes, colors and compositions that speak of seclusion and constancy. The message of this art, surveyed in the present exhibition for the first time, is that space in which to reflect or to simply be is not a picturesque luxury, but rather a deeply felt human need."

Dr. Will South in *Images of Great Salt Lake*, 1996 (Centennial)
Issues Forum keynote speaker - Friday, April 23, 2004

More details will be provided on our website: www.fogsl.org and in the Spring newsletter.

Low Lake Level Perspectives

by Selected Members of the Great Salt Lake Technical Team

Water Quality,
by Richard Denton, Division of Water Quality

The Great Salt Lake and Farmington Bay are interesting places with lower lake elevations. We continue to monitor the north and south arm for nutrients, metals, cation and anions, and the physical measurements of water quality on a quarterly basis. A general evaluation of the lake water chemistry indicates little change in most parameters except salinity which has increased. A noticeable observation of higher salinity is evident on the north arm where salt is precipitating onto any exposed object and the bottom.

Low inflows resulting from the drought is having influence on Farmington Bay. Salinity and nutrients concentrations have increased because of reduced volume in the bay.

One of the greatest effects of low lake elevations is the ability to navigate the lake and bay. On the north arm, it is difficult to launch a boat and previously covered structures have become exposed. The shallowness of the western portion of the south arm makes navigation and access difficult. The sampling point in the Ogden Bay area is extremely hard to access. Farmington Bay access through the Davis Causeway is extremely hazardous and difficult resulting in boat prop damage. Once in the bay, it is very difficult to navigate past the northern sampling point to access the southern stations. The depth at the north station is about 4 feet and a mile beyond the north station, the depth is reduced to less than 2 feet. Therefore the southern 3/4 of the bay is inaccessible with regular boats.

DWQ continues to monitor the north and south arms of the lake (the crew is on the lake as I write), Farmington Bay, and we have begun monitoring the Farmington Bay marshes. An intensive synoptic study of salinity and selenium with input from various groups and agencies begins this week for up to 20 sites in the Jordan River marshes. Data on all portions of the lake is available on the Web. Contact me after the holiday for help or go to EPA's web page and search by county.

Salinity,
by Wally Gwynn, Utah Geological Survey

A declining lake level in the south arm of Great Salt Lake, due to decreased inflow and/or increased evaporation rate, naturally results in a degree of increasing salinity. At present time, however, there is a mainly south-to-north flow through the causeway breach. That means a loss of salt from the south arm with little, if any, return flow from the north. If the two culverts are open there is a certain amount of return flow from north to south that will feed dense brine into the deep south arm layer and help maintain the overall salinity of the south arm. If the two culverts are plugged there is no return flow to help maintain south arm salinity. Under this last condition the south arm continues to lose salt. This is assuming that return flow through the causeway itself if very minimal.

Because the north arm is in reality a terminal basin (losing salt to the south arm only as return flow can take place), it currently retains most of the salt it receives from the south arm. When the north arm reaches saturation, as it did several years ago, salt precipitates and stacks up on the lake bottom. This has probably been going on for several years now. This situation is compounded when the lake level is dropping because it receives less brine from the south arm but what it does receive is more concentrated. There is less water to evaporate to maintain saturation and precipitate salt. The evaporation rate during times that the lake is dropping is probably increased as well. The salt that builds up on the floor of the north arm will remain there, perhaps for many years, until the north arm is freshened by some means, such as the 1980's flooding. If sufficient sediment covers the salt on the lake bottom, it will tend to remain there even longer because it is protected.

showed a catastrophe. A family of raccoons had found their way to the colony. In the past, the expanse of deep water prevented the animals from getting to the nests. This year, they had been able to walk most of the way to the site. Raccoons are nocturnal and likely invaded the colony during the night. The raucous bedlam of screaming birds in the black of night must have been incredible. Some of the young nestlings were killed, eggs were broken, but most died from exposure to the relentless sun after the adults abandoned the colony. The body of the adult on the nest creates shade for the young. The eared grebe colony was much smaller. Although brine shrimp remained the reduced water levels made diving and foraging difficult.

2001 - Peak water levels dropped substantially to 4201.7 feet of elevation in the south arm. The receding water left more new mudflats exposed. The freshwater running out from the marshes had rinsed salts from the mud and marsh plants again began colonizing along the waterways. The eared grebes abandoned their colony because the water was too shallow. Duck numbers began to increase, taking advantage of their preferred shallow water. Several species of ducks such as mallards, pintails and northern shovelers comprise the group known as dabblers. They tip down in the water and feed along the bottom on invertebrates such as brine fly larvae and rooted vegetation. This is the reason very shallow water is preferred by the dabblers. Snowy plovers were observed for the first time by our team. The wide, dry mud flats are preferred habitat for them. Some ibis began nesting in the deeper water areas where the new vegetation supplied the structure to attach their nests to. American avocet numbers were very high because their preferred shallow water habitats were abundant. The large mud bar in the middle of the bay began to emerge.

2002 - Peak water levels in the south arm again dropped to 4199.9 feet. The mud bar became very large. To complete the survey we were forced to drive the boat around the perimeter because the bar had formed a large peninsula from the mainland to the west. The salts leached to the surface as the mud dried giving the visual effect of dirty snow. The monotony and emptiness of the huge mud bar reminded me of the world's great deserts. Snowy plovers became more common. American avocets and black-necked stilts flourished in the shallows. Ducks became very prevalent. We followed a set of mule deer tracks for a long ways through the very shallow

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1998 - When the first survey was made in the spring, the bay reminded me of a close friend that had shaved his beard. The area looked so different, even though we knew it was the same. Water levels had climbed to 4203.2 feet of elevation in the south arm at peak levels that year. The vast mud flats from the previous year were under water. The cattails and bulrushes were stressed and turning yellow due to salts from the rising waters. When lake levels increase, salt water invades Farmington Bay through breaches in the Davis County Causeway. A flock of white-faced ibis formed a nesting colony near the outflow of the Layton marshes. The flooded bulrushes formed an ideal nesting substrate for their flimsy floating nests. American avocets were still present along the shorelines. The ducks were not as abundant because the water was getting too deep.

1999 - Peak water levels climbed to 4204.2 feet of elevation in the south arm. We were able to travel at least one half mile farther to the east due to the new beach line. Much of the bayside tall dead vegetation from last year was gone. The dead plant stems had been broken off by wave action. The white-faced ibis still had a nesting colony, but the vegetation on which they anchored their floating nests was weak. Some nests washed away during storms because of this flimsy attachment. The high water line wound along an old beach terrace where the land form stepped up slightly, which prevented the formation of muddy beaches. The expanse of water and minimal vegetation reminded me of the flood years during the 1980's. American avocets and black-necked stilts had abandoned this area because the water was too deep to forage and there was little nesting habitat. A large colony of eared grebes established themselves as residents. The water was salty enough for re-development of a healthy brine shrimp population and deep enough for them to dive and feed on the shrimp. Few ducks were found on the main body of water; it had become too deep for their liking.

2000 - Peak water levels dropped to 4203.6 feet of elevation in the south arm. Mud flats re-appeared. Wet mud flats with no vegetation have a bleak and forlorn appearance. American avocets and black-necked stilts returned and took advantage of the rejuvenated habitats. We counted over 1,000 white-faced ibis in their nesting colony near the end of June. One week later we came back and most of the ibis were gone. A hike through the very shallow water around the nests

photo courtesy of FoGSL

Sovereign Lands,
by Karl Kappe, Division of Forestry, Fire and State Lands

In preparing for this article I hitched a ride with Clay Perschon and pilot Craig Hunt on a Wildlife Resources brine shrimp harvest monitoring flight in late October. My first impression was how large the lake still is, even at its 4,195' level. As we approached Stansbury Island I noticed remarkable water clarity in the area. The algal bioherms and clear water gave the lake a tropical look. Clay smiled and said it was too bad we couldn't go down there and make a few casts for bonefish. I agreed.

East of Stansbury Island we passed over a crashed airplane, parts of which were above water. Morton Salt Company has made sure its brine intake canal is long enough.

Toward the Utah Test and Training Range the expanse of exposed lakebed was evident. Some brine shrimp harvesters were busy working the shore. Others appeared to be taking a break by lining up for an OHV event. At a recent Tech Team meeting, Don Leonard, Utah Artemia Association, mentioned there is relatively more shore harvesting now. The low lake level presents challenges in the form of navigational hazards and water access to harbors.

Farther north I noticed the boundary of the Air Force's sovereign land lease is well marked. Near Lakeside brine shrimp harbors are high and dry. There was water flowing both ways through the breach in the causeway. Some north arm salt was finding its way back to the south arm. Flying parallel to the causeway I noticed the culverts were easier to see in low water. It was difficult to tell from the air whether there was much flow through the culverts. (November measurements of culvert flows confirmed relatively low north-to-south flow through the culverts.)

Corey Milne, Great Salt Lake Minerals Corporation (GSLM), wrote that GSLM's inlet canal on the north arm was extended to reach brine. The increased concentration of potassium in the lake is favorable to production. However, the high evaporation rates exceed pump capacity and GSLM has not been able to fully capitalize on the better brine because GSLM has some pond area uncovered and not evaporating. Unfortunately, the good gets partially offset by other problems.

At Rozel Point I got my first look at the Spiral Jetty from the air. The jetty was high and dry, and there were lots of people in the area. I counted 12 vehicles at the jetty. The directional signs our Logan office placed on the way to the jetty appear to be working.

We flew over Golden Spike NHS to Bear River Bay. On this day there was a trickle of water leaving Bear River Migratory Bird Refuge. Tough times may lie ahead for the refuge. I hope the USFWS pursues funds to resolve the state-federal ownership dispute in the refuge.

The crashed plane we flew over near Stansbury Island is one of very many objects becoming exposed on sovereign land. Elsewhere objects include pilings from old resorts, fence posts, gates, remnants of sturdy duck blinds, an outboard motor, a crane and parts of military aircraft. The Division is considering options to have the objects removed, marked or charted in order to reduce hazards.

From my perspective, whatever the affects of low lake level, we're in for more of the same. Recent storms have been nice, but does anyone expect the lake not to be another two feet or so lower this time next year?

(continued on pg. 10)

A Slice of SLICE

Meet the Lake: Hike Frary Peak.

Sweeping vistas, guaranteed solitude and abundant wildlife make this a unique off season hike found only an hour from downtown SLC.

FRIENDS of Great Salt Lake Winter 2004 Vol. 10 No.2